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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
BOWMAN, MARY ELLEN				
ART UNIT		PAPER NUMBER		
4174				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/583,383

Applicant(s)

TOMAI ET AL.

Examiner

MARY ELLEN BOWMAN

Art Unit

4174

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-19 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 19 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/ISAC)
Paper No(s)/Mail Date 19 June 2006
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 19 June 2006 was considered by the examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-4 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Tokailin et al., USPN 6,828,045 B1, filed on 13 June 2003 (hereinafter referred to as “Tokailin”).
5. Regarding claim 1, Tokailin teaches an organic electroluminescent device (e.g., [0002]; “light emitting devices having organic electroluminescent material”) comprising: a cathode (e.g., [0004]; “a cathode”), an anode (e.g., [0004]; “an anode”), and an emitting layer interposed between the cathode and the anode (e.g., [0004]; “a light emitting layer of an organic EL material...[is] sandwiched between a cathode and an anode”), at least a part of the anode in

contact with the emitting layer (e.g., col 4, lines 27-31; “forming an anode on a substrate, forming an inorganic compound layer to the surface of the anode [i.e., the part of the anode contacting the emitting layer], forming an organic layer containing an emitting layer, and forming a cathode”) containing at least one element selected from the group consisting essentially of lanthanum (La), cerium (Ce), neodymium (Nd), samarium (Sm), and europium (Eu), and at least one element selected from the consisting essentially of chromium (Cr), tungsten (W), tantalum (Ta), niobium (Nb), silver (Ag), palladium (Pd), copper (Cu), nickel (Ni), cobalt (Co), molybdenum (Mo), platinum (Pt), and silicon (Si) (e.g., col 9, lines 42-47; “materials for the surface protection film include inorganic compounds...which contain one or two or more atoms selected from...Cu...Nb, Ta...Cr, W...Co...Eu, Ce, La...[and] Sm”).

6. Regarding claim 2, Tokailin teaches the invention as explained above regarding claim 1, and further teaches the total concentration of the at least one element selected from the group consisting essentially of lanthanum (La), cerium (Ce), neodymium (Nd), samarium (Sm), and europium (Eu) is 0.1 to 50 wt% (e.g., col 10, line 1; “CeSnO₄”; Note: The aforementioned compound is listed as an example of the protection film 36 covering anode layer 38, and using the atomic mass of the elements, the wt% of Ce is found to be 43.4 wt%, which is within the claimed range.).

7. Regarding claim 3, Tokailin teaches the invention as explained above regarding claim 1, and further teaches the part of the anode in contact with the emitting layer contains cerium (e.g., col 3, lines 37-39; “the inorganic compound forming the surface protection film is preferably an oxide containing a Ce atom”).

8. Regarding claim 4, Tokailin teaches the invention as explained above regarding claim 1, and further teaches the part of the anode in contact with the emitting layer has a work function of 5.0 eV or more (e.g., col 18, lines 20-22; “the work function of the surface of the IZO/CeO₂ film...was 6.12 eV”).

9. Regarding claim 19, Tokailin teaches a display (e.g., col 4, lines 18-21; “the organic EL element can be provided suitable for portable information display devices”) comprising the organic electroluminescent device as taught regarding claim 1 above.

10. Claims 11,13-16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Onikubo et al., JP 09-097676, published 08 April 1997 (hereinafter referred to as “Onikubo”). The above listed reference was cited in Applicant's Information Disclosure Statement and the full English translation has been attached to this Office Action. The English translation will be used for citation purposes throughout this Action.

11. Regarding claim 11, Onikubo teaches an electroluminescent device (e.g., [0001]; “organic electroluminescence (EL) element used for the source of the flat light, or a display”) comprising an anode layer, an organic emitting layer, and a cathode layer in sequential order (e.g., [0002]; “EL consists of a pair of opposite electrodes which sandwiched the luminous layer...an electron is poured in from the negative pole side [the cathode] and, as for the luminescence, an electron hole is poured in from the anode side”), the cathode layer containing at least a first metal (e.g., [0010]; “metallic elements (B)”) and a second metal (e.g., [0010]; “metallic elements (C)”), the standard oxidation-reduction potential (E(A)) of the first metal at 25°C being -1.7 (V) or more (e.g., [0010]; “as for metallic elements (B) which are 4.0 eV or more of work functions, there are varieties...Ag [0.7996]...Cu [0.34]...Co [-0.28]...Au

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[1.83]...nickel [-0.25]...Pd [0.915]...Pt [1.188]...[and] aluminum [-1.66]"; Note: The well known standard oxidation reduction potential of the above listed metals is written beside each metal, and each potential is greater than -1.7.), and the standard oxidation-reduction potential (E(B)) of the second metal at 25°C satisfying the following expression: $E(A) - 1.1 \leq E(B)$ (e.g., [0006]; "metallic elements (C) which are...V [-1.13]...Bi [0.5]...[and] Sn [-0.13]"; Note: The well known standard oxidation reduction potential of the above listed metals is written beside each metal, and each potential is greater than $E(A) - 1.1$).

12. Regarding claim 13, Onikubo teaches the invention as explained above regarding claim 11, and further teaches the majority component of the cathode layer is the first metal (e.g., Table 1 below, samples 7, 8-10 and 12 have metallic element (B) [i.e., the first metal] as the majority component).

実施例	合金組成および比率 A : B : C			5 Vでの初期疎度 (cd/m^2)	500時間後の疎度 (初期100 cd/m^2)
2	Mg	Al	Mn		
	10 :	1 :	1	200	70
3	Mg	Ag	Zn		
	9 :	1 :	2	250	60
4	Mg	Ag	In		
	17 :	1 :	2	280	65
5	Li	Al	Mg		
	3 :	1 :	6	310	60
6	Li	Al	In		
	4 :	2 :	4	320	55
7	Li	In	Zn		
	1 :	8 :	3	300	60
8	Sm	Al	Mn		
	4 :	5 :	1	270	55
9	Li	Al	Cr		
	2 :	90 :	8	210	75
10	Li	In	Sn		
	1 :	80 :	19	180	80
11	Yb	Al	Zn		
	5 :	2 :	3	290	70
12	Li	Sb	La		
	15 :	50 :	35	210	85

13. Regarding claim 14, Onikubo teaches the invention as explained above regarding claim 11, and further teaches the first metal is a metal selected from the group consisting essentially of Al, Cr, Ta, Zn, Fe, Ti, In, Co, Ni, Ge, Cu, Re, Ru, Ag, Pd, Pt, and Au (e.g., [0010]; “as for metallic elements (B) [the first metal] which are 4.0 eV or more of work functions, there are varieties...Ag [0.7996]...Cu [0.34]...Co [-0.28]...Au [1.83]...nickel [-0.25]...Pd [0.915]...Pt [1.188]...[and] aluminum [-1.66]”; Note: The well known standard oxidation reduction potential of the above listed metals is written beside each metal, and each potential is greater than -1.7.).
14. Regarding claim 15, Onikubo teaches the invention as explained above regarding claim 11, and further teaches the second metal is a metal selected from the group consisting essentially of Bi, Te, Sn, V, Mo, Nd, Nb, and Zr (e.g., [0006]; “metallic elements (C) [the second metal] which are...V [-1.13]...Bi [0.5]...[and] Sn [-0.13]”; Note: The well known standard oxidation reduction potential of the above listed metals is written beside each metal, and each potential is greater than $E(A) - 1.1$.).
15. Regarding claim 16, Onikubo teaches the invention as explained above regarding claim 11, and further teaches the cathode layer contains 0.1 wt% to 5.0 wt% of an alkali metal or an alkaline earth metal (e.g., Table 1 above, compound 9 has 0.4 wt% of Li, based on well known calculations using the atomic mass of the three elements and the molar ratio listed in the table).
16. Regarding claim 18, Onikubo teaches the invention as explained above regarding claim 11, and further teaches the first metal is Ag (e.g., [0010]; “as for metallic elements (B) [the first metal] which are 4.0 eV or more of work functions, there are varieties...Ag”).

Claim Rejections - 35 USC § 103

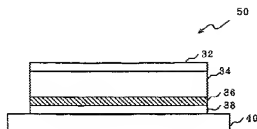
17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokailin.

19. Regarding claim 5, Tokailin teaches a conductive multilayer body comprising: an insulative transparent substrate (e.g., col 5, lines 57-61; “a substrate 40 is preferably made of a transparent rigid material...includ[ing] glass”) and a transparent conductive film formed on the transparent substrate (e.g., col 5, lines 66-67 and col 9, lines 33-34; “an anode 38 [and] a surface protection film 36”; see Figure 2 below, anode 38 and protection film 36 are formed on substrate 40), the transparent conductive film containing an oxide containing at least cerium (Ce) (e.g., col 10, lines 22-24; “oxides containing a Ce atom are preferred since more dense surface protection film can be obtained”), wherein, in a graph showing binding energy of an electron present in a cerium 3d orbital on the surface of the transparent conductive film measured by X-ray photoelectron spectroscopy, when SA represents the total peak area of the binding energy between 877 eV and 922 eV, and SB represents the total peak area of the binding energy between 914 eV and 920 eV, SB/SA which represents an area ratio of SB to SA satisfies the following expression: $SB/SA < 0.13$ (e.g., col 7, lines 49-57; “SA is the area of a peak A that is an oxygen 1s spectral peak at the binding energy of 530 ± 0.5 eV, and SB is the area of a peak B that is an oxygen 1s spectral peak at the binding energy of 532 ± 1.0 eV...the area ratio SB/SA is preferably 0.2 or less, more preferably 0.1 or less”).

Fig. 2



20. It would have been obvious to one of ordinary skill in the art at the time the invention was made to measure an area ratio between SB and SA of less than 0.1 based on the teaching of Tokailin that the area ratio of the oxygen 1s spectral peaks should be less than 0.1, because the above listed area ratio measures surface impurities, which allows for proper removal of said impurities and better adhesion between the anode and the electroluminescent layer. The binding energy at which the peaks are measured changes with the type of atom, as well as the energy level of the electron, therefore it would have been obvious to utilize the above referenced ratio to a measurement of 3d cerium peaks at the appropriate binding energies for cerium and for the 3d orbital.

21. Regarding claim 6, Tokailin teaches the invention as explained above regarding claim 5, and further teaches the transparent conductive film (e.g., anode 38 and surface protection film 36) contains at least one metal element selected from the group consisting essentially of indium (IN), tin (Sn), zinc (Zn), zirconium (Zr), and gallium (Ga), cerium (Ce), and oxygen (O) (e.g., col 10, line 26; "CeO₂ is most preferred").

22. Regarding claim 7, Tokailin teaches a method of producing the conductive body as taught regarding claim 5, comprising: forming the transparent conductive film (e.g., anode 38 and

surface protection layer 36) by sputtering at a partial pressure of oxygen of 0.1 Pa or less in a sputtering atmosphere (e.g., col 5, lines 30-31; “flow amount of sputtering gas [is] oxygen partial pressure” and col 12, lines 30-31; “sputtering gas pressure is preferably from 0.01 Pa to 3 Pa”).

23. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a partial oxygen pressure of less than 0.1 Pa based on the teaching in Tokailin of the range from 0.1 to 3 Pa, because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F2d 272, 205 USPQ 215 (CCPA 1980).

24. Regarding claim 8, Tokailin teaches an electrode substrate for an organic electroluminescent device comprising: the conductive body as explained above regarding claim 5, and a metal conductor formed on the conductive multilayer body (e.g., col 8, lines 37-38; “a cathode 32”), the transparent conductive film (e.g., anode 38 and surface protection film 36) driving an organic electroluminescent layer (e.g., col 17, lines 54-64; “substrate was prepared...organic EL element was formed...when a direct current of 6 V was applied to the organic EL element [including the substrate and the anode 38 and the surface protection film 36]...blue emission of 266 nit brightness was observed”).

25. Regarding claim 9, Tokailin teaches an organic electroluminescent device (col 2, lines 37-41; “organic EL element...[can be used for] display devices”) comprising the electrode substrate as taught regarding claim 8 above, and an organic electroluminescent layer formed on the electrode substrate (e.g., col 10, lines 44-45; “transparent electrode (anode)/surface protection film/emitting layer [organic electroluminescent layer]/cathode”).

26. Regarding claim 10, Tokailin teaches an organic electroluminescent device comprising the conductive body as taught regarding claim 5 above, and an organic electroluminescent layer formed on the conductive multilayer body (e.g., col 10, lines 44-45; “transparent electrode (anode)/surface protection film/emitting layer [organic electroluminescent layer]/cathode”).

27. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Onikubo in view of McNulty et al., USP App. Pub. No. 2003/0111955 A1, published 19 June 2003 (hereinafter referred to as “McNulty”).

28. Onikubo teaches the invention as explained above regarding claim 11, and further teaches a conductive layer on the cathode layer (e.g., [0024]; “the negative pole [the cathode] may be constituted by the metal or alloy of two or more layers if needed”). Onikubo fails to teach the layer on the cathode is transparent.

29. McNulty teaches the layer on the cathode layer is transparent (e.g., [0025]; “protective layer 100 can comprise a substantially transparent polymer”; see Figure 1 below, protective layer 100 is disposed on cathode 22).

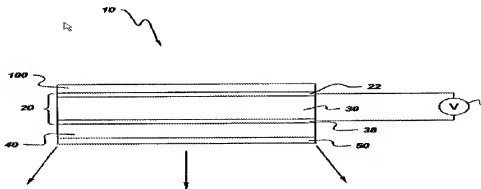


Fig. 1

30. It would have been obvious to one of ordinary skill in the art at the time the invention was made to construct the protective layer above the cathode out of a transparent material based on the teachings of Onikubo and McNulty, because utilizing a transparent material (as in McNulty) would allow the final display apparatus to be either a top or bottom or double-sided display, which would increase the commercial applications of the final product.

31. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Onikubo in view of Hosokawa et al., USPN 6,534,199 B1, published 18 March 2003 (hereinafter referred to as "Hosokawa").

32. Regarding claim 17, Onikubo teaches the invention as explained above regarding claim 11, but fails to teach the optical transparency of the cathode layer.

33. Hosokawa teaches the cathode layer has an optical transparency at a wavelength of 380 nm to 780 nm (e.g., col 26, lines 16-17; "the visible region of 400 to 700 nm") of 10% or more (e.g., col 26, lines 58-60; "it is preferable that the cathode has a transmittance of the emitted light greater than 10 %").

34. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a transparent cathode layer as taught by the prior art reference to modify the teaching of Onikubo, because a transparent cathode layer would allow the final display apparatus to be either a top or bottom or double-sided display, which would increase the commercial applications of the final product.

Conclusion

35. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARY ELLEN BOWMAN whose telephone number is

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(571)270-5383. The examiner can normally be reached on Monday-Thursday, 6:30 a.m.-5:00 p.m. EST.

36. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly D. Nguyen can be reached on (571) 272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

37. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./

Examiner, Art Unit 4174

/Kimberly D Nguyen/

Supervisory Patent Examiner, Art Unit 4174